## ABSTRACT OF THE DISCLOSURE

Systems and methods for servicing the data and memory requirements of system devices. A DMA engine that includes a data reservoir for reducing or eliminating device buffers is provided that manages and arbitrates the data requests from the system devices. An arbitration unit is provided that only allows eligible devices to make a data request in any given cycle to ensure that all devices will be serviced within a programmable time period. The data reservoir contains the data buffers for each channel of each device. A memory interface ensures that sufficient data for each channel is present in the data reservoir by making requests to a system's memory based on an analysis of each channel. Analysis factors include how much data is remaining in the data reservoir, how long will that data last, and how long until the channel will be analyzed again. Based on this analysis, a request is either made to the system's main memory, or the channel waits until it is evaluated again in the future. Each channel is thereby guaranteed a response time.

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